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ABSTRACT

This paper is a report on the development and findings of an on-going study being conducted on 126 middle schools in rural eastern North Carolina. An analysis of the technological readiness of each school is being followed with a program to offer school leaders a technology design and teacher training that will work in their schools. This includes identifying the proper equipment, software, and resources needed, as well as developing a costing and training model for school leaders and teachers to make new technology integral to the learning process through curriculum alignment. Findings indicate wide disparity in readiness and a great deal of planning with little deployment of technology and meaningful training for teachers. (MES)

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MIDDLE SCHOOL TECHNOLOGY INTEGRATION STUDY

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Abstract: This paper is a report on the development and findings of an on-going study being conducted on middle schools in rural eastern North Carolina. An analysis of the technological readiness of each school is being followed with a program to offer school leaders a technology design and teacher training that will work in their schools. Findings indicate wide disparity in readiness and a great deal of planning with little deployment of technology and meaningful training for teachers.

Introduction

Eastern North Carolina is a very rural area with a lack of resources to provide the technology necessary to level the playing field vis-à-vis more progressive areas of the state and country. Consequently, middle schools are not equipped and school leaders and teachers are not trained to use modern technology and integrate it into their curricula. Teachers continue to teach using outmoded, if often effective, methods. New methods include an emphasis on data searches using Boolean logic and a keen evaluation of the data extracted. One might term this integration of technology into classroom learning an emphasis on "keywording" rather than "keyboarding." The point is to adopt technology as a tool for learning rather than viewing it as a subject to be learned, i.e., to align the curriculum using technology.

The Study

This study is focused on establishing the level of technological readiness in 126 middle schools in eastern North Carolina and creating a model of school technology. This includes identifying the proper equipment, software and resources needed, as well as developing a costing and training model for school leaders and teachers to make new technology integral to the learning process through curriculum alignment.

Review of the Literature

Previous studies and discussions with practicing public school leaders and teachers have indicated several seemingly intractable obstacles when attempting technological initiatives in classrooms. Yerrick and Hoving (1999) reported that few teachers use technology in the classroom because of insufficient training, perceptions of social support, perceptions of lack of control of specific initiatives, and teachers' own attitudes toward technology and individual projects. Additionally, public school teachers have indicated that access to equipment and insufficient staff development are major obstacles. Staff development initiatives are often seen as one-time phenomena, with little or no follow-up.

Many studies have focused on one or more of these problems. The most oft cited are clearly procurement and proper provision of technology, training in its use, teachers' attitudes concerning the technology in specific settings and perceptions of support for technology related initiatives.

The leveling of the technological playing field is a main thrust of West Middle School in Lawrence, Kansas (Lowe & Vespested 1999). A study presently being conducted focuses on student leadership, professional development for teachers, and curricular integration. These are the most important aspects of any program designed to change the learning process from being teacher centered to being learner centered. At West Middle School this is

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being pursued aggressively in order for the students to meet desired exit outcomes. Funding for this comes from grants and local businesses.

The World Wide Web is becoming and important tool in classrooms across the country. The Web offers a distinct advantage to students over textbooks and stationary libraries. First, the information on the Web is current. Various news and other agencies post events and information as they happen. Also, one may find many differing viewpoints about any subject on the Web. Textbooks have a distinct disadvantage of containing predigested ideas and biases, presented as fact (Windschitl and Irby 1999). In preparing teachers for instruction, it is important that we inculcate the true nature of the internet into their knowledge bases and have them demonstrate a mastery of its use in the classroom. To accomplish this it is important to train prospective and practicing school leaders and teachers how to use text, audio, video, graphics and hyperlinks to incorporate into their lesson plans (Smith, Martin and Lloyd, 1999).

There is no question that the goal must be for every student to have access to a PC. This is a critical component to "leveling the playing field" for all. Students are the ultimate knowledge workers (Gates 1999). Without the proper tools, students are being programmed for failure. Our teachers are working in an environment tantamount to *planned failure*. PCs change the equation by helping make the transition away from traditional approaches to the learning experience (Gates 1999). They enable exploration, experimentation, and collaboration in a self-directed way. Teachers then orchestrate these experiences. Parents are apprised of students' accomplishments using the technology available.

Curriculum alignment is a topic of discussion in today's environment of accountability. In order to align curricula with societal expectations, one must understand the various curricular components. Glatthorn has contributed to this understanding by identifying eight types of curricula. The first he identifies is the **hidden curriculum**, e.g., the allotment of time to subjects. The more time allotted, the value students attach. Second is the **excluded curriculum**, that which is simply not taught. He cites the study of dialects as an example of an important exclusion. Third is the **recommended curriculum**; that which experts in the field believe should be taught. Fourth is the **written curriculum**, i.e., state standards, district, school and teacher developed notions of what should be taught. Fifth, Glatthorn identifies the **supported curriculum**, i.e., textbooks, software, etc., which supports the written and recommended curricula. Number six is the **tested curriculum**. This incorporates those educational ideas, facts and concepts to be tested and will reflect on the teacher, the school, the system and the state. Seventh is the **taught curriculum**, i.e., what teachers actually teach, and finally, Glatthorn identifies the **learned curriculum** or what students actually know after having experienced a specific course of study (Glatthorn 1999).

Glatthorn recognizes that only some of these curriculum types must be directly aligned. Others are, at least to some extent, only peripheral to the learning process. Important alignment areas are hidden/taught, written/recommended, excluded/written, supported/written, tested/learned, and taught/learned (Glatthorn 1999). A major component of this study will be assessment of the sufficiency of technology to the task of aligning these curricula.

Wraga cautions those who would use curriculum alignment that the practice results in low level instruction (Wraga 1999). It is important that any new pedagogical strategies using technology not resort to "skill-drill" exercises. The goal is to facilitate student immersion into the subject matter.

It is worth listing some of the Wall Street Journal's **Hard Lessons on Computers in Schools**. They offer cogent guidelines for integration of technology in the teaching/learning process. They are:

- Computer labs are lousy places for computers. They need to be in classrooms.
- Struggling students often get more out of computers than higher performers.
- Most teachers still haven't been trained on how to use computers in class.
- School systems must plan computer use carefully.
- Computers are tools, not subjects. They need to be integrated into the lessons of other subjects.
- Kids flourish when everyone has a computer.
- Hand-me-down machines are not good enough for school use. (Gates 1999)

Methodology

A questionnaire analyzing technological readiness in eastern North Carolina middle schools has been developed and sent to school leaders at 126 middle schools. Results are reported below.

A technology and costing model has been designed and will be used to bring each participating school to the same technological level for the study. Those not having the resources to equip the entire school can "scale down" the model so that those classrooms participating will have the proper equipment for the study. The model is attachment 1 of this paper.

Schools have been selected for the pilot portion of this study based on their answers to the readiness questionnaire, their willingness to participate, and their abilities to deploy the proper technology. These pilots are being conducted using eighth grade English Literature teachers, students and state standards. Information on the progress of pilots is becoming available now.

Students in participating classrooms are being pre-tested using a non-confidential writing prompt used as an example on the NCDPI web page. This prompt is similar to one used to assess writing competency at the end of the seventh grade year. Teachers will be trained to integrate technology into their classes by aligning these curricula according to the Glatthorn categories discussed in the literature. Students will be post-tested at the end of the spring 2000 semester using the same instrument. Results will be available in early summer.

A control group will be given the same pre and post-tests, with more traditional interventions, for comparison.

All essays written as a result of the prompt will be scored using the criteria developed by NCDPI.

Findings

Each questionnaire was reviewed and the following preliminary findings have been determined:

- Most middle schools in eastern North Carolina have technology plans in place (See Table 1)
- Many but not all of these plans include a component designed to provide training in the use of technology (See Table 2)
- Most schools have the majority of their computers in labs (See Table 3)
- Most schools have a few (2-3) computers in actual classrooms (See Table 3)
- Computers are used for some, very limited, individualized instruction (See Table 4)
- A majority of teachers in eastern North Carolina middle schools have access to email and some use it to correspond with parents, other teachers, administrators, etc. (See Table 5)
- A majority of eastern North Carolina middle schools have web sites (see Table 6)
- There is an approximate student/computer ratio of 5/1 in middle schools in eastern North Carolina (See Table 7)

Tables

82.15

Table 1: Reported Percentage of Eastern North Carolina Middle Schools with Technology Plan in Place

78.57

Table 2: Reported Percentage of Eastern North Carolina Middle Schools with a Comprehensive Plan for Training Teachers in the Use of Technology

Percentage in Labs Only	Percentage with Computers Deployed Mostly in Labs	Percentage with Majority of Computers Deployed in Classrooms
14.28	85.72	0.00

Table 3: Reported Deployment of Computers in Eastern North Carolina Middle Schools

None	Some	Much Individualized Instruction Using Computers
17.85	82.15	0.00

Table 4: Reported Amount of Individualized Instruction Using Computers in Eastern North Carolina Middle Schools

Percent with No Interaction	Percent Interacting Among Teachers and Administrators	Percent Interacting Among Teachers, Administrators and Parents
39.2	18.0	42.8

Table 5: Reported Amount of Computerized Interaction Among Teachers, Administrators and Parents

60.8

Table 6: Reported Percentage of Eastern North Carolina Middle School Web Sites Maintained

Mean Ratio	Median Ratio	Modal Ratio	Range
5.7/1	5/1	4.76/1	2.29/1 – 200/1

Table 7: Reported Student/Computer Ratio in Eastern North Carolina Middle Schools

Figures

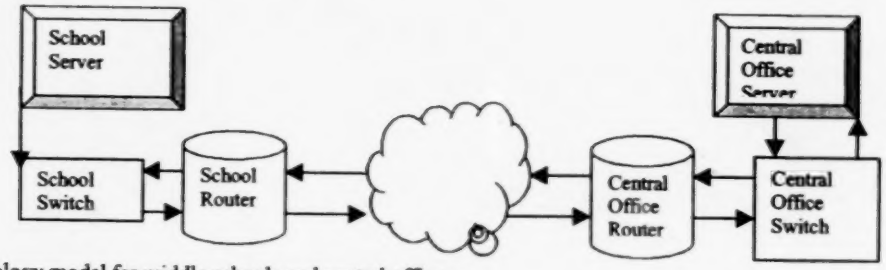

Figure 1: Technology model for middle schools and central offices

Cost Item (for 500 student school) (Assuming 20% of computers already available)	One-time Ed. Discount	One-time E-Rate	On-going Ed. Discount	On-going E-Rate
Computers Needed (Appropriately Equipped)	$ 600,000	$ 600,000	$ 250,000	$ 250,000
Wiring	$ 125,000	$ 62,500	$ 0	$ 0
Server	$ 12,500	$ 6,250	$ 0	$ 0
Switch(s)	$ 12,500	$ 6,250	$ 0	$ 0
Router	$ 20,000	$ 10,000	$ 0	$ 0
ISP	$ 90,000	$ 45,000	$ 90,000	$ 45,000
Phone Company	$ 2,500	$ 1,250	$ 2,500	$ 1,250
LAN Administrator	$ 40,000	$ 40,000	$ 40,000	$ 40,000
Total	**$ 902,500**	**$ 771,250**	**$ 382,500**	**$ 336,250**
(Approximately $675 per student per year with E-Rate)				

Figure 2: Costing model for middle schools

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Cost Item (for 20 person central office)	One-time Ed. Discount	One-time E-Rate	On-going Ed. Discount	On-going E-Rate
Wiring	$ 5,000	$ 2,500	$ 0	$ 0
Server	$ 12,500	$ 6,250	$ 0	$ 0
Switch(s)	$ 2,500	$ 1,250	$ 0	$ 0
Router	$ 20,000	$ 10,000	$ 0	$ 0
ISP	$ 2,400	$ 1,200	$ 90,000	$ 1,200
Phone Company	$ 2,500	$ 1,250	$ 2,500	$ 1,250
LAN Administrator	$ 40,000	$ 40,000	$ 40,000	$ 40,000
Total	**$ 84,900**	**$ 62,450**	**$ 132,500**	**$ 42,450**

Figure 3: Costing model for central offices

Principal/Assistant Principal and Teacher training will be designed using writing prompts similar to those used by NCDPI to test students at the end of the seventh grade.

1. The trainer will assist the participants in downloading text examples of primary and secondary sources for use as part of a sufficient number of lesson plans to cover one semester in an eighth grade Language Arts class. The participant will review and work with the trainer to establish a viable base of information to begin the lessons.
2. Audio tools will be used to demonstrate their effectiveness to the participant. Some will be from sources external to the internet and others will be downloaded from cyberspace.
3. Graphics from the internet and other sources will be integrated into lesson plans.
4. Hyperlinks to pertinent data will be developed for use.
5. Discussion between the trainer and the participant will shape the lesson plans into something useful and comfortable to the participant.

The next step in the study will be to actually integrate the lesson plans into the classroom. Using the lesson plans as guides, the participating teacher, with guidance and input from school leaders, will (throughout the semester):

1. Introduce new concepts using the internet, where appropriate.
2. Promote discussions using the internet, where appropriate.
3. Give assignments requiring use of the internet.
4. Use the World Wide Web for presentations by the teacher and students.
5. Use email discussion lists.
6. Determine student mastery on a periodic basis.

Figure 4: Middle School Technology Training Model for School Leaders and Eighth Grade Language Arts

References

Gates, Bill. (1999) Prepare for the Digital Future. *Business @ the Speed of Thought.* New York: Warner Books.

Glatthorn, Allan. (1999) Curriculum Alignment Revisited. *Journal of Curriculum & Supervision*, 15 (1), 26-34.

Lowe, Michael J. and Vespestad, Karen M. (1999) Using Technology as a Tool to Enhance Teaching and Learning. *National Association of Secondary School Principals Bulletin*, 30-37.

Nisan-Nelson, Paula D. (1999) Teacher Training and Distance Education: The Effect of On-Line Education and Teacher Attitudes. *International Journal of Educational Telecommunications*, 143-156.

Smith, Sean J., Martin, Kerri F. and Lloyd, John Wills (1999) Preparing Prospective Teachers on the Web. *Computers in Education*. Sluice Dock, Connecticut: Dushkin McGraw-Hill.

Windschitl, Mark and Irby, Janet (1999) Tapping the Resources of the World Wide Web for Inquiry in Middle Schools. *Computers in Education*. Sluice Dock, Connecticut: Dushkin McGraw-Hill.

Wraga, William G. (1999) The Implications of Curriculum Alignment and Standards-Based Reform. *Journal of Curriculum & Supervision*, 15 (1), 4-25.

Yerrick, Randy K. & Hoving, Timothy J. (1999) Teachers and Innovation: Examining Technology Initiatives Through Teachers' Planning and Practice. *East Carolina Clinical Schools Network: Excellence Through Partnerships*, 86-125.